

WHAT IS CLAIMED IS:

1. A solid sorbent composition for removal of carbon dioxide and other acidic components from a gaseous stream, said composition being a product of a reaction of a mixture of at least one liquid absorbent material selected from the group consisting of amino alcohols and amino alcohols in combination with a sodium carbonate, a sodium bicarbonate, a potassium carbonate, a potassium bicarbonate and mixtures thereof, with at least one hardener selected from the group consisting of at least one metal oxide, wherein said metal is selected from the group consisting of zinc, aluminum, magnesium, alkaline earth metal oxides and mixtures thereof, said absorbent being capable of absorbing carbon dioxide and other acidic components and said reaction product being formed by heating the above mixture to effect a chemical reaction between the components of the above mixture with formation of a reaction product wherein said liquid absorbent material and said hardener combine upon heating to form said solid sorbent composition.
2. The solid sorbent composition according to claim 1, wherein said absorbent material is present in an amount of at least 40 wt/wt%.
3. The solid sorbent composition according to claim 1, wherein said hardener is present in an amount of at least 10 wt/wt%.
4. The solid sorbent composition according to claim 1, wherein said other acidic components are selected from the group consisting of SO_2 , H_2S , HCl and NO_2 .
5. The use of the solid sorbent composition of claim 1, for removal of carbon dioxide from a gaseous stream wherein said solid sorbent is introduced into said gaseous stream at a first temperature and upon saturation of said absorbent material with carbon dioxide said solid sorbent is heated to a second higher temperature, at which said carbon dioxide is released, thereby enabling the recycling of said solid sorbent for reintroduction into said gaseous stream.
6. The use of the solid sorbent composition of claim 1, for removal of carbon dioxide from a gaseous stream, wherein said solid sorbent is introduced into said gaseous stream at a temperature lower than 80°C , and upon saturation of said absorbent material with carbon dioxide said solid sorbent is heated to a temperature higher than 85°C , whereby said carbon dioxide is released,

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thereby enabling the recycling of said solid sorbent for reintroduction into said gaseous stream.

7. The use of the solid sorbent composition of claim 1, for removal of carbon dioxide from a gaseous stream, wherein said solid sorbent is introduced into said gaseous stream at a temperature lower than 60°C, and upon saturation of said absorbent material with carbon dioxide said solid sorbent is heated to a temperature higher than 65°C, whereby said carbon dioxide is released, thereby enabling the recycling of said solid sorbent for reintroduction into said gaseous stream.
8. The use of the solid sorbent composition as claimed in claim 5, wherein said gaseous stream includes moisture.
9. The use of the solid sorbent composition as claimed in claim 5, wherein moisture is added to the gaseous stream.
10. The use of the solid sorbent composition as claimed in claim 5, wherein said sorbent is moisturized prior to the introduction thereof into the gaseous stream.
11. The use of the solid sorbent composition of claim 1, for removal of other acidic components from a gaseous stream, wherein said solid sorbent is introduced into said gaseous stream, and upon saturation of said absorbent material with said acidic components said sorbent is replaced.
12. The use of a solid sorbent composition of claim 1 for removal of carbon dioxide from a gaseous stream wherein said solid sorbent is introduced into said gaseous stream at a first temperature and upon saturation of said absorbent material with carbon dioxide said solid sorbent is heated to a second higher temperature of between 65°C and 125°C, at which said carbon dioxide is released, thereby enabling the recycling of said solid sorbent for reintroduction into said gaseous stream.
13. A method for preparing a solid sorbent composition of claim 1 for removal of carbon dioxide and other acidic components from a gaseous stream, comprising:
 - e) mixing at least one absorbent material selected from the group consisting of amino alcohols and amino alcohols in combination with a sodium carbonate, a sodium bicarbonate, a potassium carbonate, a potassium

bicarbonate and mixtures thereof, with at least one hardener selected from the group consisting of at least one metal oxide, wherein said metal is selected from the group consisting of zinc, aluminum, magnesium, alkaline earth metal oxides thereof, said absorbent material being capable of absorbing said carbon dioxide and other acidic components when in a liquid state;

f) heating the above mixture to effect a chemical reaction between the components of the above mixture with formation of a reaction product;

g) processing the above reaction product into a granulated form; and

h) drying said granulated sorbent.

14. A method according to claim 12, wherein said mixture is heated at a temperature of up to 100°C.
15. The method for preparing a solid sorbent composition according to claim 12, wherein said liquid component is present in an amount of at least 40 wt/wt%.
16. The method for preparing a solid sorbent composition according to claim 12, wherein said hardener is present in an amount of at least 10 wt/wt%.
17. The method for preparing a solid sorbent composition according to claim 12, wherein said other acidic components are selected from the group consisting of SO₂, H₂S, HCl and NO₂.

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